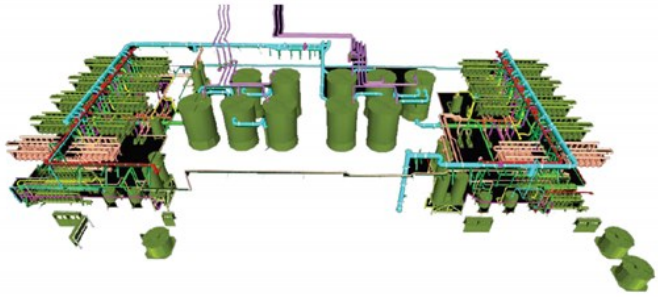
LIQTECH

HEAVY METAL REMOVAL CASE

STATE-OF-THE-ART Silicon Carbide ceramic membrane system secures compliance with the most stringent environmental requirements

The Case

The client runs one of the largest mining operations in Europe and uses direct seawater for cooling in many processes. During discharge, the waste streams contain heavy metals that have to be removed on a continuous feed flow basis of 480 m³/h - 2,116 GPM.



The Solution

The goal was to quickly validate the membrane capabilities during an on-site pilot test. It was determined the SiC ceramic membranes could remove the heavy metals as required and would withstand the cleaning regime needed to maintain stable permeability with warm seawater up to 50°C / 122°F.

Beyond the supply of 3.000 m² / 32,292 ft² membranes for particle separation, LiqTech supplied the complete SiC filtration system including installation on-site. The installation involved filtration and dewatering skids, 10 large 40m³ / 1,412 ft³ precipitation/buffer tanks, and chemical dosing for precipitation and cleaning.

LiqTech System Design

Materials and Components

The membranes are made from silicon carbide material which proves to be extremely robust with high permeability and stable flux. Further, the ceramic membranes are chemically inert and very temperature resistant.

Membrane multi-housings are made of glass fiber reinforced plastics (GRP) and single housings of polypropylene. Piping is made of polyethylene and all-welded by our certified craftsmen on-site.
Pumps are high-efficient Grundfos in duplex steel grade with ABB motors.
All components and pipes are mounted on stainless steel SS316L frames and supports.

Modular Systems

The filtration systems are made in semi-dead end configuration for particle removal utilizing our OD25mm CoMem UF SiC membrane in a 99X GRP multi-housing in racks of 6 housings.

The cross-flow dewatering system is based on the OD146mm CoMem UF SiC membrane in a PP single housing in racks of 6 and multiple trains.

Cleaning Method

The system is built with Grundfos DDA and DMX dosing pumps for membrane cleaning. Further LiqTech supplied chemical storage tanks with thermal insulation and heating coils including CIP storage and waste handling tanks - all fabricated in-house and in PE material.

LiqTech Installation

- 15 particle removal systems / 8.900 OD25mm UF SiC membranes / 3,000 m² - 32,292 ft² surface area
- 6 dewatering systems / 42 OD146mm SiC UF membranes / 315 m² – 3,390 m² surface area
- Temperature up to 50°C
- Capacity 480 m³/h – 2,116 GPM (2 x systems in series. Actual membrane capacity is 960 m³/h – 4,232 GPM)
- Seawater feed with heavy metal contaminants

Talk to an Expert

Please do not hesitate to contact us if you need help with a liquid filtration system.

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